

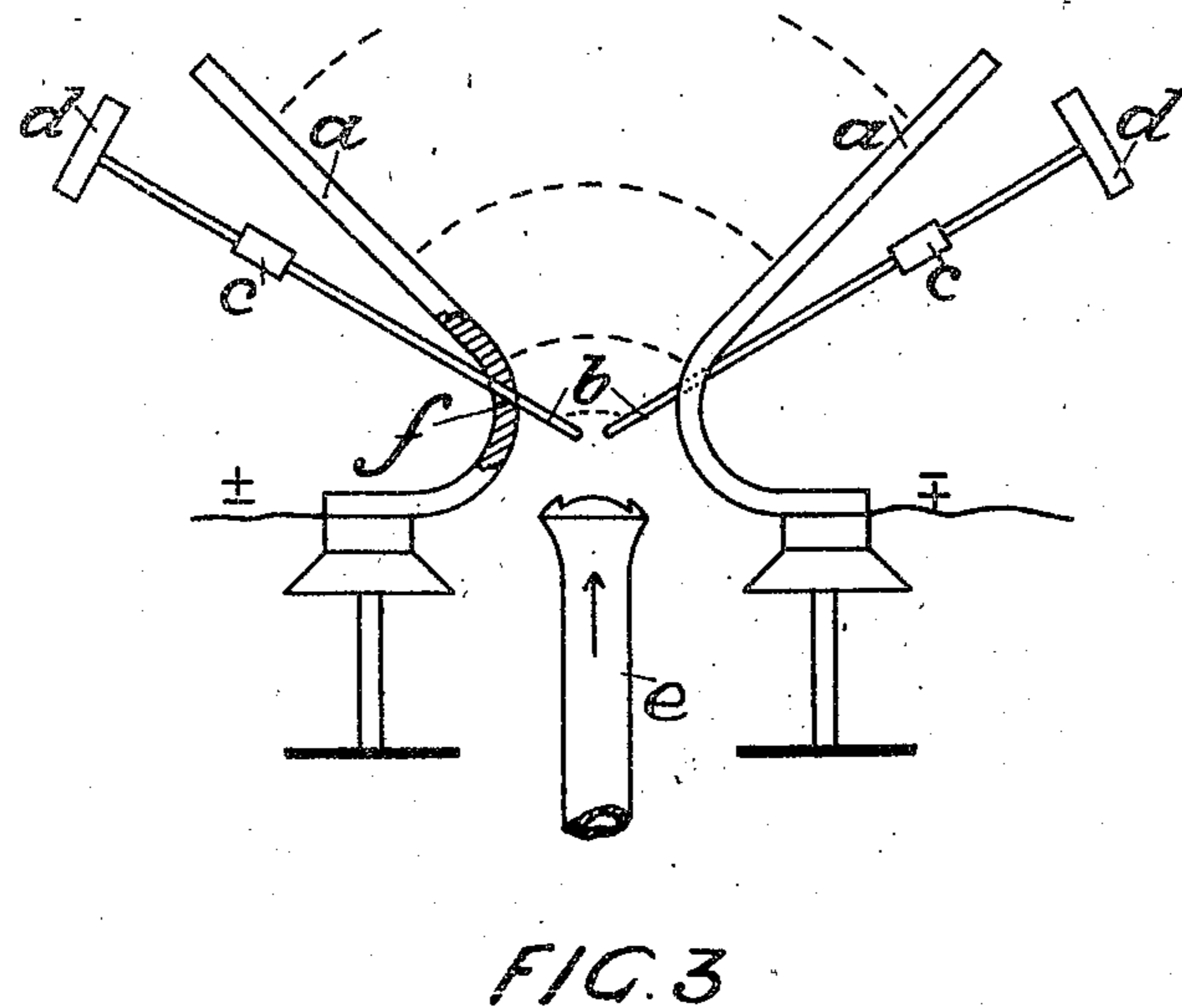
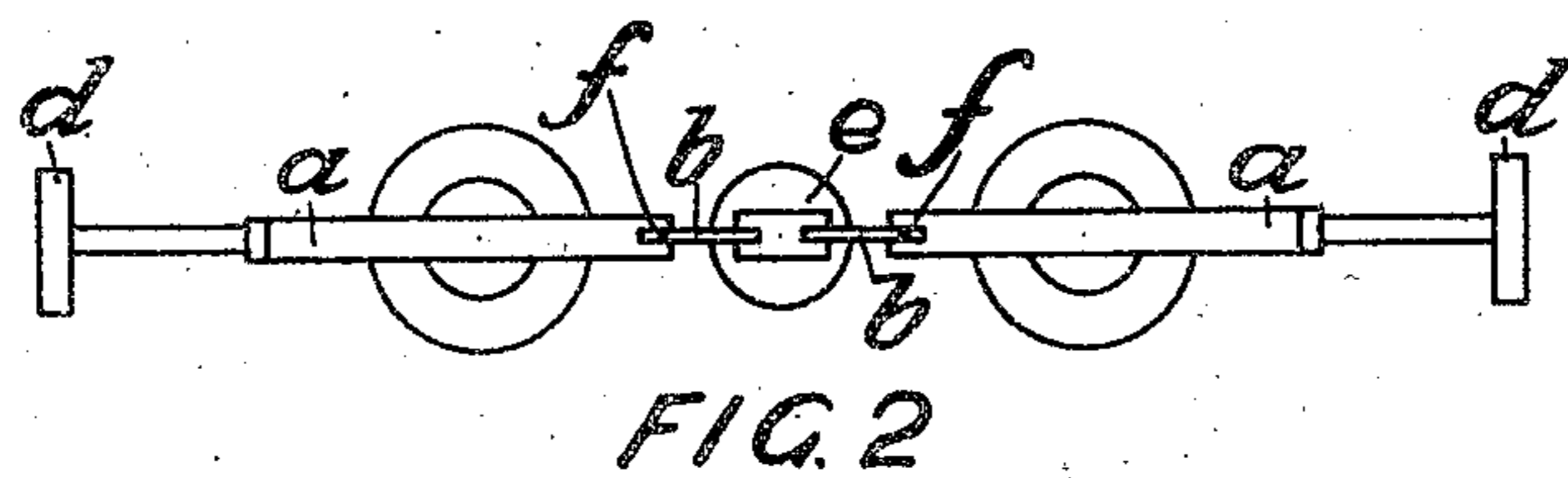
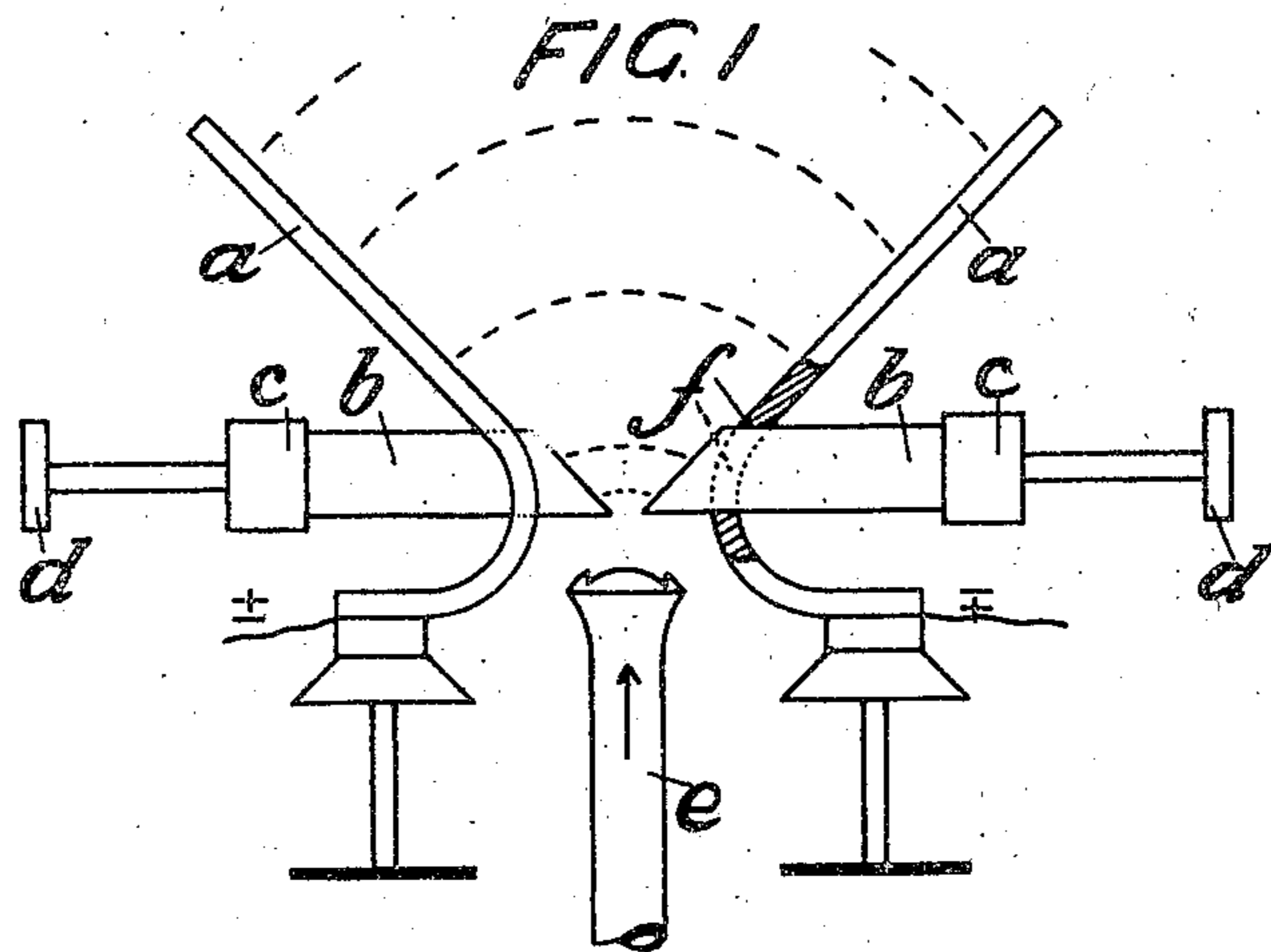
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H. PAULING.

APPARATUS FOR PRODUCING VOLTAIC HIGH CURRENT ARCS.

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APPARATUS FOR PRODUCING VOLTAIC HIGH-CURRENT ARCS.

No. 887,220.

Specification of Letters Patent.

Patented May 12, 1908.

Application filed September 30, 1907. Serial No. 395,314.

To all whom it may concern:

Be it known that I, HARRY PAULING, a subject of the German Emperor, and resident of 84 Wilhelmstrasse, in Gelsenkirchen IV, in the Province of Westphalia, Kingdom of Prussia, Germany, have invented certain new and useful Improvements in Apparatus for Producing Voltaic High-Current Arcs, of which the following is a specification.

My invention relates to apparatus for the production of voltaic high-current arcs and more particularly to devices of the kind in which the arcs are produced by means of diverging electrodes and by a current of gas which blows the discharges, jumping the space of greatest proximity of the electrodes, along the latter so as to form arcs of the required great lengths, which break and extinguish after having attained a definite length. The length of the arcs mainly depends, on the one hand, upon the length of the electrodes and upon the angle between the latter, while on the other hand it is largely dependent on the strength of current supplied to the electrodes, and on the force of the said current of gas inasmuch as arcs of great length require an accordingly great amount of energy as well as the action of an accordingly strong current of gas, as will be readily seen. Electric currents, however, of the strength to be considered in this respect require the electrodes to be accordingly large in cross section, that is to say these must be very thick. The latter requirement in its turn has been found to render it difficult for the said current of gas to blow with sufficient force between the electrodes to produce arcs of the required great length, the reason being that the distance of greatest proximity of the diverging electrodes must be very short, a few millimeters for instance, in order that the energy supplied to the electrodes may be able to jump such space automatically.

My present invention allows the electrodes to be dimensioned as thick as may be requisite or desirable in view of the energy to be received by them, while the strength of the aforesaid current of gas will in no wise be affected, so that the two best conditions for the purpose in view are enabled to cooperate, namely, a very high electric energy and a strong current of gas.

To such end my invention consists, broadly, in dimensioning the space of greatest proximity of the electrodes so that the current of

gas, blown through such space, may be allowed to pass through it freely, that is, without the electrodes intervening in its path, and in providing means for starting the discharges, which would not take place otherwise on account of the distance of greatest proximity of the electrodes being too large in this way.

The accompanying drawing shows two forms of construction embodying my invention, Figure 1 being an elevation, partly in section, Fig. 2 a plan to Fig. 1, and Fig. 3 a view similar to Fig. 1, and illustrating a slight modification.

Like letters of reference denote corresponding parts in the several views.

a, a are a pair of stationary diverging electrodes, and *e* is a pipe designed to blow a strong current of gas through the space of greatest proximity of the electrodes and in the direction of divergence thereof, as indicated by the arrow. Either of the electrodes *a* has a perforation *f* in which an auxiliary electrode *b* is adapted to slide. The electrodes *b* are thus electrically connected with the electrodes *a*. Either of them has a suitable handle or the like *d* from which it is insulated by an intermediate piece *c*. The arrangement is such that the distance between the points of the auxiliary electrodes can be adjusted at will.

While the electrodes *a* may be as broad as requisite or desirable in view of the energy to be received by them, the electrodes *b*, whose points necessarily intervene in the path of the current of gas leaving the pipe *e*, must be so shaped that they offer the least possible resistance to the passage of this gas current. To such end it will be advantageous to make them in the form of blades, as is shown in Figs. 1 and 3, or of rods, as will appear from Fig. 2.

The function of the arrangement described is, briefly, as follows: The discharges brought about between the auxiliary electrodes *b* by adjusting these according to the energy supplied to the electrodes *a* are caused by the current of gas leaving the pipe *e* to pass over to the diverging electrodes *a* and are blown along the latter so as to form arcs of great lengths; after having attained a definite length such arcs break and extinguish. Some of the variations the discharges undergo in this way are approximately indicated by dotted lines in the drawing.

In order to facilitate the passing over of

the discharges to the electrodes *a* the auxiliary electrodes *b* may, in the case of the form of construction shown in Figs. 1 and 2, be beveled at their points, in the manner represented; with the construction disclosed in Fig. 3 the same object is obtained by the rods, which constitute the auxiliary electrodes in this case, being arranged inclined, as shown.

Changes in the form, proportion, size, and the minor details may be made without departing from the spirit or sacrificing any of the advantages of this invention.

What I claim is:

1. In an apparatus for producing voltaic high-current arcs, the combination of a pair of diverging electrodes with means for blowing a current of gas through the space of greatest proximity of the electrodes and in the direction of divergence thereof, the said space being large enough not to disturb a free passage of the said gas current, and with means for starting the discharges, substantially as set forth.

2. In an apparatus for producing voltaic high-current arcs, the combination of a pair of diverging electrodes with means for blowing a current of gas through the space of

greatest proximity of the electrodes and in the direction of divergence thereof, the said space being large enough not to disturb a free passage of the said gas current, and a pair of auxiliary electrodes electrically connected to the former electrodes and extending into the space between the latter, substantially as specified.

3. In an apparatus for producing voltaic high-current arcs, the combination of a pair of diverging electrodes with means for blowing a current of gas through the space of greatest proximity of the electrodes and in the direction of divergence thereof, the said space being large enough not to disturb the free passage of the said gas current, and a pair of adjustable auxiliary electrodes electrically connected to the former electrodes and extending into the space between the latter, substantially as described.

In witness whereof I have hereunto signed my name this 22 day of June 1907, in the presence of two subscribing witnesses.

HARRY PAULING.

Witnesses:

CARL HEINRICH,
RICHARD STERKEL.